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WG KRUMMRICH - CERCLA -
DEAD CREEK - 1987-87

CER 114376

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File - W6K Dead Creek

Monsanto

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September 21, 1987

VIA CERTIFIED MAIL

Mr. Bill Child, Manager
Division of Land Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

Dear Mr. Child:

Attached for your information are the Monsanto comments on the Dead Creek Sites Remedial Investigation/Feasibility Study which were prepared with the assistance of Geraghty & Miller, Inc.

Sincerely,

Warren L. Smull /bjj

Warren L. Smull
General Superintendent
Environmental Affairs

/bjj
Attachment

cc: Jeffrey Larson, IEPA Springfield
Bharat Mathur, IEPA Springfield

CER 114377

bcc: R. L. Biggerstaff - F2WJ
W. C. Engman
M. R. Foresman - G4WT
S. P. Krchma - E2NG
T. Kuhns - Kirkland & Ellis
N. Valkenburg - Geraghty & Miller

COMMENTS ON THE DEAD CREEK SITES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Submitted By

Monsanto Company

CER 114378

September, 1987

COMMENTS ON THE DEAD CREEK SITES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SCOPE OF WORK

Table 1 (attached) shows the scope of work that IEPA and E&E originally proposed for the Krummrich landfill (Site R in the work plan), the revised scope, and the work which was actually performed. Originally, there was virtually no sampling proposed for the site; but under the revised study, E&E plans to collect 54 air samples and six ground-water samples. The ground-water study is complete and the air quality study is now underway; however, it is impossible to determine how many air samples will be collected at Site R because the 54 samples proposed for both Sites Q and R have not been separated by site. Presumably, the ground-water samples are to confirm the analytical results which were submitted in November 1986 to IEPA in Monsanto's ground-water study report which was prepared by Geraghty & Miller, Inc.

CER 114379

The air quality study at the landfill will provide data of dubious value. It will be extremely difficult to differentiate the effects of Site R on air quality from impacts caused by other sources, such as stack emissions. Given the general level of industrial activity in the area, other sources are likely to have a much greater impact on air quality than the Krummrich Landfill itself. In

addition, the landfill is covered by two to 20 feet of silty clay, which will severely restrict any air emissions. There has been no evidence in the past of volatile emissions, such as odors. The available data indicates that the landfill has had virtually no impact on air quality; and because the cap is expected to virtually prevent volatile organics and particulate matter from escaping, people will not be exposed to airborne contaminants originating from the landfill.

In the second (H/A) phase of work, IEPA and E&E propose to collect surface soil, subsurface soil (for permeability analyses only), ground water and seep samples. The installation of two three-well clusters, adjacent to the landfill, has also been proposed for this phase of the study. The water samples would be analyzed for dioxins, PCBs, mercury, lead and cadmium. Monsanto believes the second phase of this work is unnecessary because all of the data which IEPA may need for a Health Advisory Mechanism study has been included in the Geraghty & Miller, Inc. ground-water report previously submitted by Monsanto to the IEPA in November 1986.

CER 114380

On behalf of Monsanto, Geraghty & Miller, Inc. has estimated the quantity of priority pollutants discharging to the Mississippi river from Site R at 77 pounds per day which enters the river, not as a point source, but distributed over the east side of the river bottom. Dilution is so

great in the river that the 77 pound-per-day discharge rate will probably result in no measurable impact. The discharge quantity was calculated from data obtained from 45 wells, which already monitor all three hydrogeologic zones, and a three-year-long study of river stage and water-level fluctuations.

Limited sampling for dioxins in the landfill monitoring wells indicate that this compound is not present in the ground water. The existing data base for mercury, lead, cadmium and PCBs shows that these metals are not a concern at Site R. If these compounds are not present in the ground water, they cannot be discharging to the river from Site R.

Task 1B (the water-level study) is also unnecessary because Geraghty & Miller, Inc. has obtained over three years of water-level data from seven automatic recorders on wells on the Monsanto property. River stage data from the U.S. Army Corps of Engineers gage on the Poplar Street Bridge were found by Geraghty & Miller, Inc. to be adequate for tracking river level elevations.

CER 114381

Page 3-25 of the E&E work plan states that historical water-level records indicate that a cessation of pumping will cause the water table to rise "within a few feet of the surface" at Site R. To our knowledge, there are no historical records that indicate this will occur; and our study

indicates that this assertion is incorrect. Large-scale industrial pumping has been drastically curtailed and, except for some intermittent pumping for dewatering purposes associated with the installation of the new sewer system, there is no pumping at either the Sauget or Krummrich Landfills.

The depth to water at Site R during flood stages in the river can be estimated by utilizing existing water-level data compiled by Geraghty & Miller, Inc. during the study which began in November 1983. The Mississippi River reached its highest level in recorded history in April 1973 when its stage was determined to be 43.3 feet above gage zero, or 423.2 feet above mean sea level (msl). The second highest river stage level occurred on October 9, 1986 (a stage of 39.0 feet or 418.9 feet above msl). At that time, a well adjacent to the Mississippi River (outside the landfill) recorded its highest water level of 10.5 feet below land surface. The depth to water in the landfill itself was greater due to the higher topography.

CER 114382

During other high river stage conditions (30 - 35 feet above gage zero) when all landfill monitoring wells were measured, the depth to water in the landfill was typically 21 to 28 feet below land surface. The elevation of the water table under these conditions has not exceeded 404 feet above msl and our 4 year record indicate that it has not

risen above the bottom of the fill which drilling records show is between 405 and 418 feet above msl.

In any event, contaminants "in the upper portions of the site soil" will not be transported at increased rates during times of high river stage as postulated by E&E. In fact, high river stages result in the bank storage effect which, in turn, reverses the hydraulic gradient. When river levels are high, flow is from the river to the study areas; and under these circumstances the discharge of contaminants actually ceases. Our study indicates that flow reversal occurs approximately 12% of the time. As water levels decline with a decreasing river stage it is possible that additional contaminants may enter the ground-water system, if they are present in the unsaturated zone that is only affected under flood conditions.

CER 114383

There is also no evidence that buried drums (if they exist) at Site R will rupture at high river stages. The drilling programs in the Krummrich Landfill did not encounter any drums at 32 drilling locations and, even if drums were present, there is no reason to expect them to rupture suddenly, causing a "slug" of contamination to move into the river.

FIELD WORK

The following sections discuss E&E's execution of the field work which was observed by Geraghty & Miller, Inc. This work consisted of ground-water sampling on March 25, 1987 at the Krummrich Landfill. In addition, Geraghty & Miller, Inc. collected replicate samples from each of the six Monsanto wells that were sampled by E&E. A description of the observed activities is provided below.

Ground-Water Sampling Program

On March 24, 1987 E&E and Geraghty & Miller, Inc. collected replicate ground-water samples from six of Monsanto's monitoring wells (P-1, P-7, P-11, B-25A, B26A, and B-28A) located in and adjacent to the Krummrich Landfill. Each sample was analyzed for the EPA Hazardous Substances List (HSL) of compounds. Field and trip blanks were also submitted for analysis. Our observations are described below.

CER 114384

- Upon collection of ground-water samples Geraghty & Miller, Inc.'s representative placed the sample bottles in a precooled insulated sampling container. E&E placed its samples in cardboard boxes and left them unprotected from the sun until the end of the day. At that time the samples were placed in coolers with ice packs.

- At the end of the day, E&E iced only samples scheduled for organic analyses even though E&E's work plan states that "All samples will be iced prior to shipment" (Appendix B-Section 4 in the E&E work plan).

- Sampling protocols in the E&E work plan do not specifically state when samples are to be cooled; however, the USEPA TEGD (RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, September 1986) specifically states that "Preservation of samples requires that the temperature of collected samples be adjusted to 4°C immediately after collection."

- E&E analyzed ground-water samples for pH, specific conductance and temperature at the end of the day in its field office; however, the USEPA TEGD requires that these parameters be analyzed in the field immediately after sample collection. This is required because these parameters are subject to change over short time intervals.

CER 114385

- E&E's metal filtration procedures involved: returning the samples to E&E's field office at the end of the day, filtering one sample, changing the filter paper, pumping distilled water through the filtering

equipment for approximately 15 to 30 seconds and filtering the next sample. The silicon tubing was only changed at the end of the day, after having been used for all samples collected during the day. E&E's standard procedures of not changing the silicon tubing after each sample is filtered and also not decontaminating the filtering equipment according to either their own protocols or USEPA protocols can result in cross contamination of the samples. USEPA "Test Methods for Evaluating Solid Waste" (SW-846) requires that water samples collected for metals analysis should be filtered and acidified at the time of collection in order to prevent the precipitation of metals from occurring.

- E&E decontamination protocols (Appendix B - Section 9 in its work plan) require that sampling equipment used at more than one location be decontaminated between locations by the following cleaning sequence: scrub with brushes in a detergent solution, rinse with deionized water, rinse with acetone, rinse with hexane, rinse with acetone and rinse with deionized water. These procedures were obviously not followed.

CER 114386

- The ground-water recovery rate was very slow in well B-25A; therefore, E&E decided not to wait for a sufficient volume of water to fill all of the required

sample bottles. E&E chose to omit the sample for metals.

SUMMARY

The results for the metals analyses may not be representative of ground-water quality because the samples were not cooled during shipment and decontamination protocols were not followed during filtration. In addition, filtration of the samples was done at the end of the day, rather than at the time of collection as recommended in the TEGD.

The results of organic analyses may also not be representative of ground-water quality because the samples were not properly preserved according to USEPA protocols. If there is little agreement between the analytical results of E&E's samples and Geraghty & Miller, Inc.'s split samples, the wells may have to be resampled.

- END -

Table 1. Summary of Work Completed as of July 15, 1987 and Proposed Work at the Krummrich Landfill (Site R)

Sampling	Original Scope (May, 1986)	Revised Scope (August, 1986)	Work Actually Performed (as of July 15, 1987)
HAZARD RANKING SYSTEM			
Air Sampling	0	54*	0
Surface Soil	0	0	0
Subsurface Soil	0	0	0
Surface Water/Sediment	0	0	0
Ground Water	0	6	6
Seeps along River	0	0	0
HEALTH ADVISORY MECHANISM			
Air Sampling	0	0	-
Surface Soil	0	6*	-
Subsurface Soil	0	6	-
Surface Water/Sediment	0	0	-
Ground Water	0	6	-
Seeps along River	0	6*	-

*Sites Q and R combined.

CER 114388

COMMENTS ON THE DEAD CREEK SITES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Submitted By

Sauget Sanitary Development and Research Association

CER 114389

September, 1987

COMMENTS ON THE DEAD CREEK SITES
REMEDIAL INVESTIGATION/FEASIBLITY STUDY

SCOPE OF WORK

In choosing the well and boring locations, the IEPA does not appear to have taken into consideration the Geraghty & Miller, Inc. study, which was conducted at the request of the Sauget Sanitary Development & Research Association (SSDRA). The proposed IEPA work duplicates much of the work that has already been completed. We believe that the Geraghty & Miller, Inc. study generated sufficient information for the purposes and objectives of the Dead Creek Sites study and IEPA should have scaled back its effort at the site. The savings in effort and resources could have been devoted to other sites where much less information is available.

CER 114390

There do not appear to be sound technical reasons for the locations of some of the wells and borings. The IEPA has drilled five soil borings in and around the four old lagoons. Three of the IEPA borings are very close to borings that were made by Geraghty & Miller, Inc. The enclosed map shows that the IEPA drilled borings close to BG-4, BG-6 and RA-G, locations for which data was already available. The Geraghty & Miller, Inc. report entitled, "Assessment of Ground-Water Conditions at the Village of Sauget Treatment Plant Sites, Sauget, Illinois", which was submitted to the IEPA in December, 1986, contains the analytical results of

soil samples that were collected from BG-4 and BG-6 and also contains the results of analytical work that was done by the contractor responsible for the construction of the new treatment plant.

Five wells were also drilled in the area. While some wells such as EE-24 are located in areas which appear to be designed to supplement Geraghty & Miller, Inc.'s work, the well drilling program duplicates much of the work that has already been done by Geraghty & Miller, Inc. The enclosed map shows that one IEPA well (EE-22) was drilled between GM-19 and GM-22, leaving the western boundary of the site between Wells GM-23 and GM-19 without a well.

There appears to be no justification for an additional upgradient well located off the northeastern boundary of the lagoons because upgradient wells already exist at two locations on the Monsanto property to the east. Well GM-7 and cluster GM-18 monitor upgradient water quality in the shallow and intermediate hydrogeologic zones. Data from these wells have already been provided to IEPA in the Geraghty & Miller, Inc. ground-water report for the Monsanto property, which was submitted in December, 1986.

CER 114391

The IEPA drilled a fourth well (EE-23) south of the southern boundary of the lagoon area and a fifth well (EE-25) downgradient of the southwest corner of the lagoons.

Presumably, these wells will determine the impact on ground-water quality of the lagoons. However, data from Well EE-25 well duplicates the information obtained from GM-23 and EE-23 is not downgradient of the lagoon area. In addition, E&E's study does not include any well clusters which makes it impossible for it to draw any conclusions about the vertical component of ground-water flow or the quality of ground water in the intermediate and deep zones.

FIELD STUDY

The following sections discuss E&E's execution of the field work which was observed part-time by Geraghty & Miller, Inc. this work consisted of observing a portion of the drilling and soil boring programs on February 26 and 27, 1987, and ground-water sampling on March 24, 1987 and July 14, 1987. In addition, Geraghty & Miller, Inc. collected replicate samples from each of the five E&E wells that were sampled on both occassions. The sampling program performed on July 14, 1987 was conducted to resample each well because 3 of the 5 sets of samples that were collected on March 24, 1987 could not be analyzed by E&E. A description of the observed activities is provided below.

Well Installation Program - Dead Creek Area (Site G)

At the time of our site visit, all but three of the Dead Creek Sites program's wells had been installed. The three remaining wells were part of a group of 12 wells that were scheduled to replace wells installed near Dead Creek in 1981. The old IEPA monitoring wells were being replaced because they probably do not yield representative ground-water samples due to their design (i.e., hacksaw slotted well screens and glued well joints). Therefore, these 12 replacement wells were to be installed according to IEPA guidelines (see E&E work plan, page 3-14). Geraghty & Miller, Inc. observed the installation of two of these replacement wells, designated as EE-G102 and EE-G103, which are located southeast of Site G. Our observations are as follows:

- Soil samples were collected at 5-foot intervals. E&E stated that soil samples were not collected at all for some of the replacement wells installed earlier because the geology was known from the 1981 IEPA study. When he was questioned, the E&E field geologist did not know how soil samples were collected during the previous program, nor did he know the intervals of previously collected samples.

- All soil sample collection equipment was cleaned in a single bucket of potable water for each of the two wells. As this procedure does not conform to E&E sampling protocols in the work plan, these samples should not be chemically analyzed.

- Soil samples were smelled in the field and touched with unprotected hands to facilitate sample description. Soil vapor detection equipment was not utilized to determine the level of contamination even though odors were identified by E&E's project manager at site EE-G103. After well construction drill cuttings remaining were spread on the ground around the well and used to fill in the drill rig's tracks, even though these materials may have been contaminated.

- According to E&E, the only criteria for containerization of drill cuttings is whether the site is in a grassy area or not.

CER 114394

- Neither hard hats nor safety glasses were worn in the field, therefore, it did not appear that E&E were working in accordance with any formalized health and safety plan.

- The new wells were installed to the same depth as the old IEPA wells adjacent to these sites, even when the geology encountered suggested that the predetermined depth was inappropriate. For example, at site EE-G102 silt was found in the 18 to 20-foot sample. The E&E geologist directed the driller to install the well screen at 16.5 to 21.5 feet below land surface, without even consulting the project manager, who was observing the drilling.

- The well screen and casing for Well EE-G102 arrived at the site in the back of a pickup truck. It was not steam cleaned in the field prior to installation, even though other drilling equipment was being steam cleaned at that time.

- During well installation the drilling crew picked up the well screen and casing with dirty gloves and installed the well materials down the hole as the screen and casing slid through their gloves.

CER 114395

- Upon setting the well screens at both well locations, E&E directed the driller to wait for the formation to collapse around the well screen. As this took time, the driller ran the augers up and down the borehole to encourage further collapse of the formation. The use of a gravel or sand pack was not

considered, even though it is part of E&E's well installation protocol (E&E work plan, page 3-15). When asked why a sand or gravel pack was not used, E&E stated that gravel packs are used only if the formation will not collapse around the well screen.

- After a pelletized bentonite seal was set in the well annulus, drill cuttings were shoveled and kicked into the remainder of the annulus as a bag of dry cement was poured down the hole. Finally, a bucket of potable water was added to the hole from a dirty bucket to complete the well seal. This protocol does not meet any formalized protocol in use at any state or federal investigation sites. It clearly does not meet the well construction protocols provided in E&E's work plan shown on page 3-15.

- Upon completion of Well EE-G103, the rig and drilling equipment were moved to the next site (Well EE-G102). At this location (Well EE-G102) the drill rig, augers, tools and rig tires were steam cleaned and the decontamination water was allowed to soak into the ground. No attempt was made to contain the water. Once the cleaning procedures were completed, the drilling of the next well (Well EE-G102) began in the decontamination area for Well EE-G103.

- At site EE-G102, gasoline was spilled on the ground by the operating engineer as he filled up a generator's gas tank. This spill occurred approximately 15 feet from Well EE-G102.

- During the installation of Well EE-G102, E&E's project manager commented that 5-foot well screens are too short and that he prefers longer ones; however, the well construction materials were purchased before he became project manager.

- Upon completion of Well EE-G102, the total depth was determined using a dirty tape measure.

Soil Boring/Well Installation Program Conducted on Village of Sauget Property

CER 114397

At the time of Geraghty & Miller, Inc.'s site visit, all five monitoring wells at Site O (the four old treatment lagoons) were completed. E&E installed only four of the five wells at locations of their choice, and E&E intended to install the last well in an upgradient area, however, it is Geraghty & Miller, Inc.'s understanding that E&E did not approach the representatives of SSDRA to gain access for the installation of the upgradient well. E&E's project manager said the fifth well (EE-25) was installed near Well GM-23 because the area was easily accessible. When asked if he tried to find a well location that would aid in the inter-

pretation of existing water quality data in the possession of E&E (the Geraghty & Miller, Inc., December 1986 report), the project manager said he was not familiar with the data in the report. Well EE-25 was installed only 100 feet hydraulically downgradient from Well GM-23. This site (Site O) is approximately 25 acres in size and ground-water contamination has not been found in either well.

Soil boring (EE-9) was completed on February 26, 1987 during Geraghty & Miller, Inc.'s site visit. The boring was completed using hand-auger equipment because the site was too soft to support a drilling rig. Geraghty & Miller, Inc.'s observations are as follows:

- All tools and sampling equipment were steam cleaned in the Dead Creek area, transported to the site, and laid in the dirt and grass in lagoon No. 1.

CER 114398

- Two split spoon samples were collected every five feet. Between sample collection intervals the sampling equipment was rinsed in solutions in the following sequence: potable water, hexane, acetone, and two more potable water rinses. The sequence of cleaning solutions according to E&E protocol (E&E Work Plan - Appendix B, Section 9) is a trisodium phosphate or equivalent solution, deionized water, acetone, hexane, acetone, and deionized water. The

procedures followed by E&E's field geologist and project manager were clearly not according to its own protocols. In addition, E&E did not allow the equipment to air dry after the acetone rinse, nor did it add detergent to the initial rinse water. The practice of allowing sampling equipment to air dry prior to the final deionized water rinse will prevent acetone from interfering with the volatile organic compound analysis. The final rinse water used by E&E had a sheen on the surface after the first time it was used, which may have resulted from the acetone and/or hexane. E&E used this water throughout the boring. In addition, the split spoon sampling equipment was put together when it was wet and it was used again before it was dry. These procedures are not in conformance with current USEPA protocols (RCRA Ground-Water Monitoring Technical Enforcement Guidance (TEGD), USEPA, September 1986). The guidelines in this document are to be used at RCRA facilities.

CER 114399

- Soil samples were placed in a wide mouth jar in the field. These samples were screened later with an HNU or OVA detector in E&E's office after they had been warmed in water. Soil samples were composited for the 0 to 10 foot zone and for the 10 to 20 foot zone, and transferred to standard VOC 40 ml vials.

These results will ultimately indicate soil quality for over a 10-foot interval, but contamination may only be present in a zone a few inches thick. Below the water table, laboratory results may be indicative of ground-water quality and not soil quality. E&E's protocol for compositing soil samples without regard for the depth of the water table may result in misinterpretation of the data.

- There is a significant risk of losing volatile organic compounds (VOCs) by transferring the soil samples twice during the field screening procedure. The USEPA TEGD states that, "It is not an acceptable practice for samples to be composited in a common container in the field and then split in the laboratory, or poured first into a wide mouth container and then transferred into smaller containers". In addition, there is a considerable amount of field equipment in the E&E field office, dirt on the floors, and vehicles in the adjacent garage (used by E&E and others for storage) that could result in false positives being recorded during the screening procedure. A study of background concentrations of compounds in volatile compounds in the air in these areas should be made before sample screening to determine background air quality.

CER 114400

Ground-Water Sampling Program

On March 24, 1987, E&E and Geraghty & Miller, Inc. collected replicate ground-water samples from E&E RI/FS monitoring wells EE-21 through EE-25. Each sample is scheduled to be analyzed for the EPA Hazardous Substances List (HSL) of compounds. In addition, both parties collected replicate samples from Well EE-24, as well as field and trip blanks. In addition, this program had to be repeated on July 14, 1987 because 3 of the 5 sets of samples collected on March 24, 1987 were frozen in E&E's laboratory. Geraghty & Miller, Inc.'s observations of this portion of the study are described below.

- On February 27, 1987, E&E's project manager stated that the wells installed by E&E cannot sustain a flow of water. This is due, in part, to the absence of a gravel/sand pack around the well screens. As a result, E&E bailed the monitoring wells to develop them. Bailing is usually inadequate for development purposes.

CER 114401

- Also on February 27, 1987, E&E's project manager stated that during the sampling program the wells would be bailed dry and sampled the next day. This is in violation of USEPA protocol. The USEPA TEGD recommends that low yielding wells be evacuated to

dryness and sampled "as soon as the well recovers sufficiently". As E&E did not provide any protocol in its proposal for evacuating low yielding wells, USEPA protocols should have been followed.

- Each of the E&E wells has a five-foot well screen that was installed below the water table. The monitoring wells are not vented, therefore, water-level measurements may be inaccurate. The lack of a vent hole is in violation of E&E's protocol as shown on the well construction diagram in its work plan (Figure 3-1).

- Upon collection of ground-water samples on both occasions, Geraghty & Miller, Inc.'s representative placed the sample bottles in a precooled insulated sampling container. On March 24, 1987, E&E field personnel placed their samples in cardboard boxes until the end of the day where they were exposed to the direct sunlight. At that time the samples were placed in coolers with ice packs. On July 14, 1987, the same procedure was followed, with the exception that VOC samples were placed in ice chests shortly after sample collection. However, all other sample bottles were left in the sun in cardboard boxes as previously described.

sample, changing the filter paper, pumping distilled water through the filtering equipment and filtering the next sample. The silicon tubing was only changed at the end of the day, after having been used for all samples collected during the day. During the July 14, 1987 program, the first sample was filtered for metals prior to changing the filter paper, which was stained with sediment and obviously had been used before. E&E followed the same filtration procedures during the second sampling round as was used in February, 1987. E&E's standard procedures of not changing the silicon tubing after each sample is filtered and also not decontaminating the filtering equipment according to either their own protocols or USEPA protocols can result in cross contamination of the samples. Samples scheduled for metals analysis should be filtered and acidified at the time of collection in order to prevent metals precipitation from occurring as required by the USEPA "Test Methods for Evaluating Solid Waste" (SW-846).

CER 114403

- E&E decontamination protocols (Appendix B - Section 9 in its work plan) require that sampling equipment used at more than one location be decontaminated between locations by the following cleaning sequence: scrub with brushes in a detergent solution, rinse

- During the preparation of sample shipment on February 27, 1987, E&E's project manager directed his sampling team to ice only samples scheduled for organic analyses even though E&E's work plan states that "All samples will be iced prior to shipment" (Appendix B-Section 4 in the E&E work plan).

- Sampling protocols in the E&E work plan do not specifically state when samples are to be cooled; however, the USEPA TEGD (RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, September 1986) specifically states that "Preservation of samples requires that the temperature of collected samples be adjusted to 4°C immediately after collection."

- E&E analyzed ground-water samples for pH, specific conductance and temperature at the end of the day in their field office; however, the USEPA TEGD requires that these parameters be analyzed in the field immediately after sample collection. This is required because these parameters are subject to change over short time intervals.

CER 114404

- On February 27, 1987, E&E's metal filtration procedures involved: returning the samples to E&E's field office at the end of the day, filtering one

with deionized water, rinse with acetone, rinse with hexane, rinse with acetone and rinse with deionized water. These procedures were obviously not followed during either sampling round.

Infiltration Rate

On July 14, 1987, E&E conducted a field measurement to determine the infiltration rate of the silty clay cap which covers lagoon No. 2, using a double-ring infiltrometer. The standard test method for this procedure states that rates determined by ponding of large areas are considered the most reliable method of determining the infiltration rate, but the high cost makes the double-ring infiltrometer method more economically feasible. The standard test method also states that this method is difficult to use and the resultant data may be unreliable in soils with high percentages of clay. Many factors affect the infiltration rate such as the moisture content of the soil. E&E conducted its test after a week of heavy rainfall.

CER 114405

Because of the many variables involved, the standard test method states that tests made at the same site are not likely to give identical results and the rate should primarily be used for comparative purposes. E&E planned to conduct only one test at only one location for the 25-acre site.

Air Sampling Program

Beginning in July 1987, E&E began conducting its air monitoring survey using air sampling devices that consisted of electric pumps which drew ambient air across charcoal tubes. These units were operated using gasoline-powered generators. The first sampling station was set up at Site G (south of Cerro Corporation). At this site, wind was generally blowing from the south and southwest; therefore, E&E set up one station south (upgradient) of Site G and two stations along the northern boundary (downgradient) of Site G. The sampling stations were to collect air samples over a 12-hour period. For these sampling stations to be representative of upgradient and downgradient locations, the wind must not change direction and the traffic along Queeny Avenue (adjacent to Site G) must not interfere with the collection of the air samples. In addition, these air sampling stations should have been operated using portable battery packs as the gasoline-powered generators produce VOCs and particulate matter that may be erroneously interpreted as originating from Site G.

CER 114406

The air quality study undertaken by E&E will provide data of dubious value. First of all, it will be extremely difficult to demonstrate what impact the Dead Creek Sites are having on air quality in the region and it will be very

difficult to differentiate the affects of the sites themselves from impacts caused by other sources, such as stack emissions. Given the general level of industrial activity, other sources are likely to have a much greater impact on air quality that the sites themselves.

In addition, with the exception of Dead Creek, most if not all, the sites are covered with clean soil which should restrict emissions. Also, there is no evidence of volatile emissions from any of the sites.

SUMMARY

Scope of the IEPA RI/FS

Given the duplication of effort and the fact that Geraghty & Miller, Inc. study has generated sufficient information for a determination of the environmental impact and preliminary remedial action planning, the IEPA should have limited its work on the site to some additional sampling of the existing monitoring wells. The IEPA's approach to site O should have been similar to the approach taken for site R (the Krummrich landfill) where there is a large amount of environmental information which the agency was able to take into consideration when it planned the Dead Creek Sites Study.

Field Work

E&E field personnel had little knowledge of the groundwater study completed by Geraghty & Miller, Inc. on the Village of Sauget property (Site O). This lack of awareness of existing water quality data precluded E&E from selecting the most logical locations for monitoring wells. In addition, E&E did not contact SSDRA representatives for any help in providing E&E with the access they required.

E&E's field crews, in many instances, did not follow accepted protocols for monitoring well construction, soil sampling and the collection and preservation of water samples. The correct procedures for the most part were outlined in E&E's work plan; however, this plan was not followed. The result of this nonconformance to accepted protocols may mean that many, if not all, water and soil sample are not representative of environmental conditions.

- END -